

5. CIRCULATION

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A. INTRODUCTION

The Circulation Element is one of the seven mandatory elements of the General Plan according to Government Code §65302. Circulation is an important part of a vibrant community. An effective transportation system not only provides vital multi-modal transportation service connecting all land uses, but is also directly related to the social and economic development of the City. In order to have a healthy economic system, there is a need for a connected and efficient circulation system.

This chapter describes the transportation system of the City of Clearlake and provides an inventory of existing conditions and emerging directions for Clearlake's transportation infrastructure. The information in this chapter serves as the factual basis of the General Plan's Circulation Element and will help inform future transportation and land use decisions. State law recognizes the close relationship between the Circulation and Land Use elements of the General Plan. Accordingly, each element's policies must be consistent with all other policies in the General Plan. Thus, all goals, objectives, policies, and programs in the Circulation element will reflect a balance between land uses and the transportation infrastructure serving them.

1. Community Characteristics

This section provides an overview of the travel behaviors of Clearlake residents. It analyzes the vehicle availability, modal split, and the travel time of residents and the related implications on the overall circulation network of the City.

Vehicle Availability

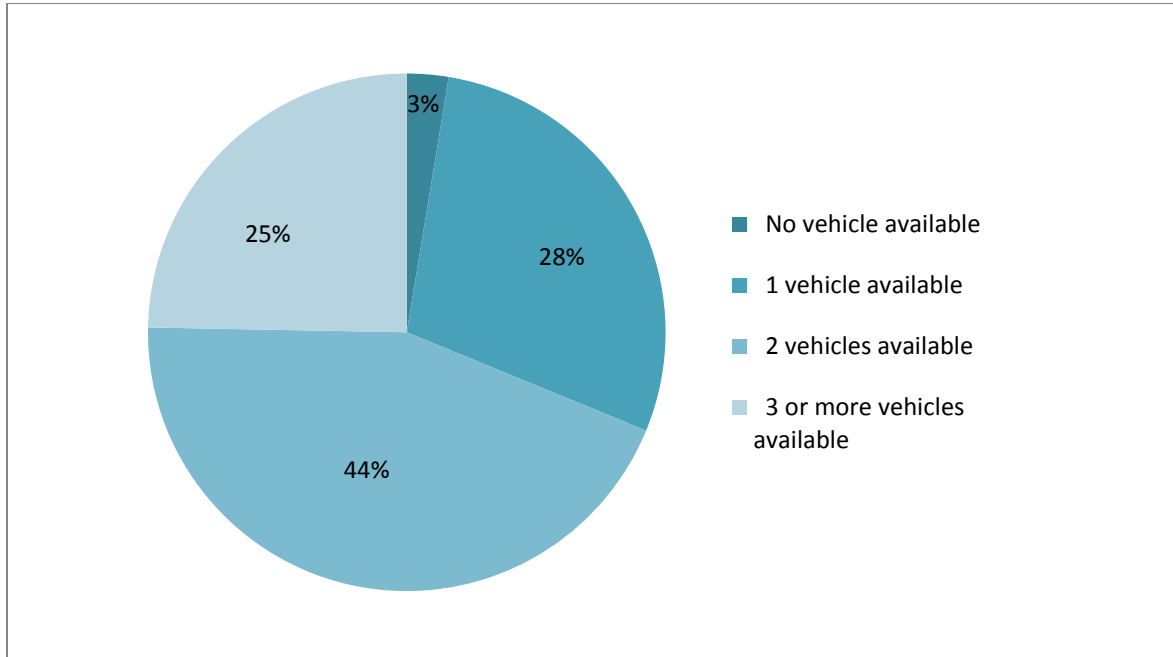
Figure 5.1 shows vehicle availability per household in the City of Clearlake. Residents owning at least one vehicle make up 97 percent of the community's households, leaving 3 percent of the households without access to motorized transportation. This highlights the citizens' automobile dependency. It appears that the automobile is the preferred method of transportation for Clearlake residents.

Modal Split

Figure 5.2 shows the residents' modes of transportation to work. A majority, 84 percent, of the working population commutes by car. Of these, 72 percent drive alone and the other 12 percent carpool. Only 7 percent of residents use a non-motorized means of transportation to work, including walking or biking.

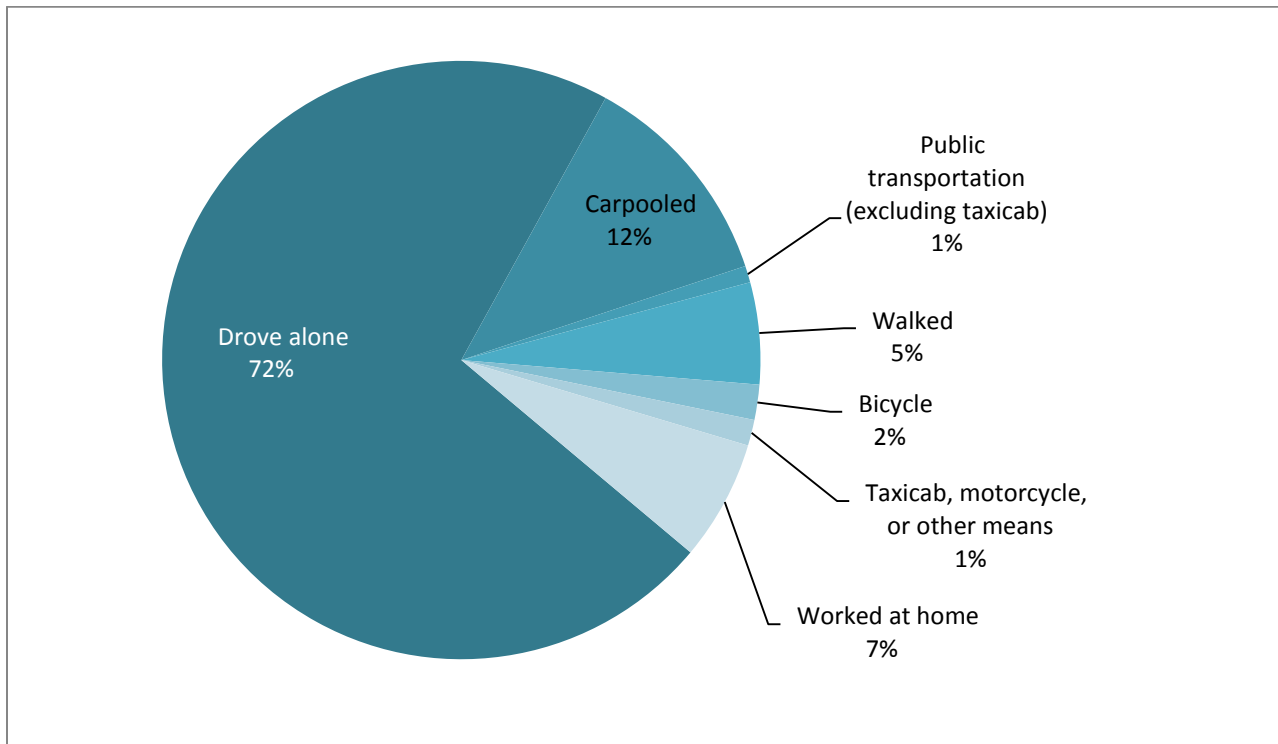
Table 5.1 Compares Clearlake's commute modal split to national, state and county averages. The percent of Clearlake workers driving to work alone is slightly lower than the national, state and county averages. Public transportation use is much lower than the state and national average, which may be because of Clearlake's rural character and low-density land use patterns. Rates of walking and biking to work, however, are almost twice California's average.

Figure 5.1 Number of Vehicles Owned by Clearlake Residents, 2010



U.S. Census, Table S0801: Commuting Characteristics by Sex, 2010

Figure 5.2 Means of Transportation to Work in Clearlake, 2010



U.S. Census, Table S0801: Commuting Characteristics by Sex, 2010

Table 5.1 Means of Transportation to Work				
Mode	United States	California	Lake County	Clearlake, CA
Drive Alone	76.4%	73.3%	77.8%	71.9%
Carpool	9.7%	11.1%	10.7%	11.9%
Public Transportation	5%	5.2%	0.7%	0.9%
Walk	2.8%	2.8%	4.0%	5.5%
Bike	0.6%	1.1%	0.0%	1.9%
Other	5.5%	6.5%	6.8%	7.9%

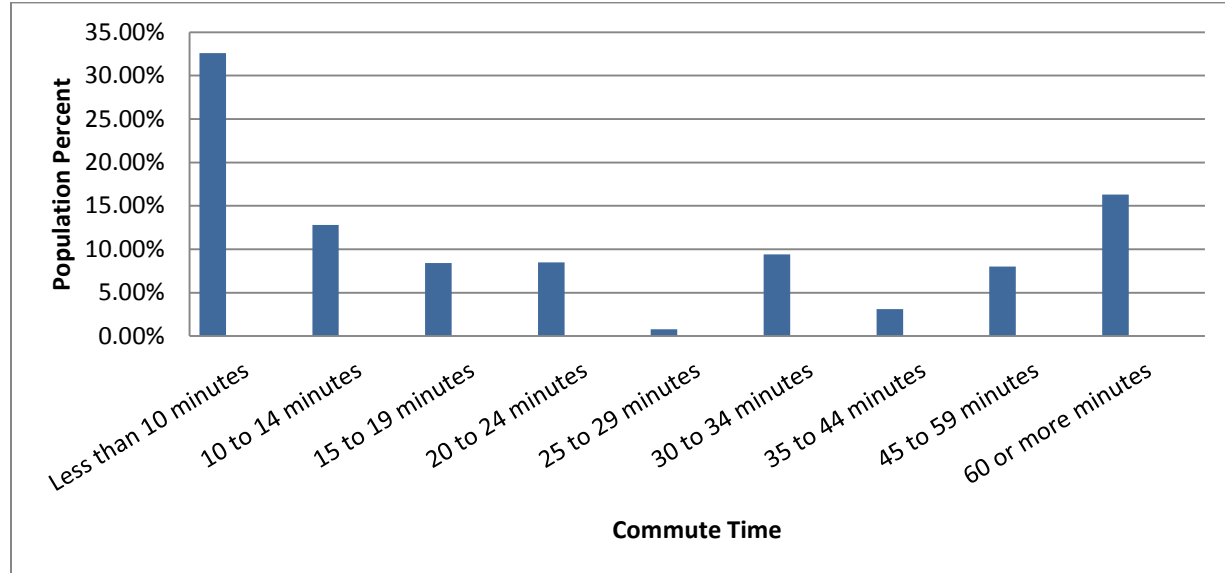
U.S. Census, Table S0801: Commuting Characteristics by Sex, 2010

Commute

Figure 5.3 shows the commute time to work for Clearlake residents based on 2010 data from the U.S. Census Bureau. Approximately 30 percent of Clearlake residents live within a 10 minute commute to work, and approximately 15 percent commute for more than one hour.

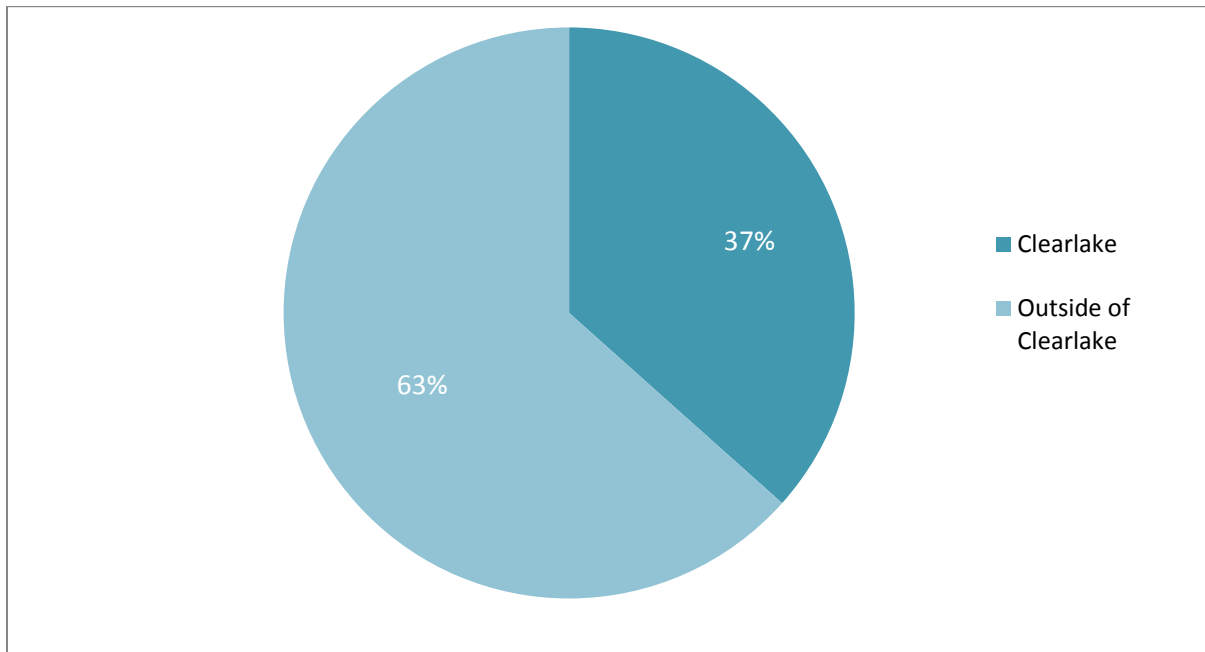
Figure 5.4 shows the proportion of Clearlake residents who live and work in the City. Approximately 37 percent of residents work within the city limits, while 63 percent work outside the city limits. This explains the long commute times shown in Figure 5.3.

Figure 5.3 Travel Time to Work



U.S. Census, Means of transportation to work, Summary File 3, H44, 2010

Figure 5.4 Clearlake Residents' Job Locations, 2010



U.S. Census, Tiger Map, 2010

Summary

It is clear that Clearlake is a very automobile oriented community. Most residents have commute times over ten minutes and leave Clearlake for employment. Moreover, biking and walking are not prominent forms of transportation, even for the 30 percent of the population who work within Clearlake. The low levels of walking and cycling may reflect inadequate biking and walking infrastructure.

B. EXISTING CONDITIONS

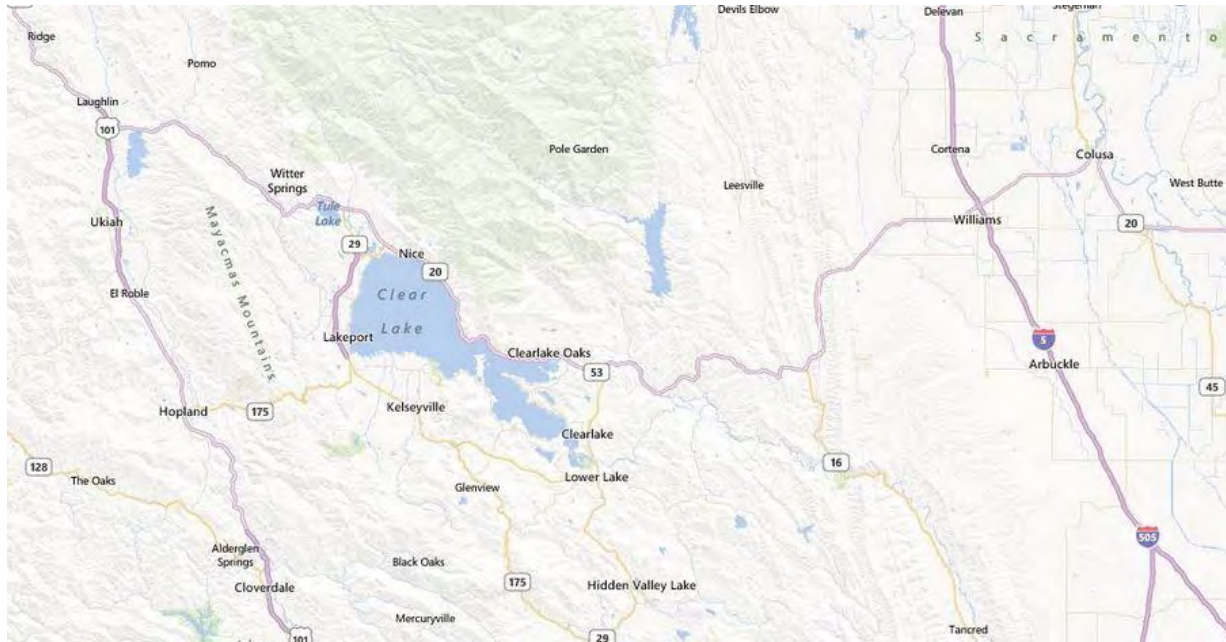
1. Existing Roadways

Regional Road Network

I-5 and U.S. 101

Lake County is located in rural Northern California. State Route (SR) 53 bisects the City of Clearlake and carries interregional and local traffic. SR 53 is a National Highway System (NHS) roadway. One of the long-term goals for this corridor is for SR 53 to become part of an interregional traffic route between Interstate 5 (I-5) and U.S. 101. Both I-5 and U.S. 101 are major north-south highways within the State of California. I-5 is a freeway thoroughfare while U.S. 101 has freeway segments. Figure 5.5 shows the overall regional network.

Figure 5.5 Regional Road Network around Clearlake



Bing Maps (2012)

State Route 53

State Route 53 (SR 53) is the main roadway link into and out of Clearlake. It is a major arterial that is approximately 7.5 miles long from SR 20 at the north to SR 29 at the south. The four-lane section of SR 53 extends from SR 29 in the south to approximately 600 feet north of 40th Avenue. It is a two-lane roadway from north of 40th Avenue to SR 20. SR 53 has a posted speed limit of 50 miles per hour (mph). Daily traffic volumes on SR 53 vary from 19,000 vehicles per day (VPD) on the south end, to approximately 10,000 VPD near SR 20. The annual traffic growth rate along the SR 53 corridor is slightly under one percent. To the north it connects via SR 20 westward to U.S. 101 and eastward to I-5. To the south it connects via SR 29 and SR 175 westward to U.S. 101.

State Route 20

State Route 20 (SR 20) is generally a two-lane highway. The posted speed limit is 55 mph to the east and west of SR 53. SR 20 runs along the north shore of Clear Lake and serves many tourist communities. It has limited traffic capacity, and generally low speed limits within the built-up areas along the Lake. The annual traffic growth rate has been four percent for segments east of SR 53 and two percent for segments west of SR 53.

State Route 29

State Route 29 (SR 29) is a two-lane highway with a posted speed limit of 55 mph in the area near Lower Lake. SR 29 south of Lower Lake extends through Middletown near Mt. Saint Helena into Napa County, where it is the major north-south roadway. From its intersection with SR 53 in Lower Lake, it heads in a northwesterly direction to the west of Clear Lake and ends at SR 20

in the Upper Lake area. Some segments have been improved to expressway and freeway standards (some with four lanes) and have a 65 mph posted speed limit, as in Kelseyville and north Lakeport. SR 29 carries 12,000 VPD at Lower Lake, south of Clearlake.

Street Hierarchy

Roadways serve as the primary transportation route regional and local travel of people and goods to and within the area of Clearlake. Clearlake has adopted and refined its definition of roadway classifications from the Lake County General Plan as well as in accordance with American Association of State Highway and Transportation Officials (AASHTO) and Federal Highway Administration (FHWA) standards. The street hierarchy is presented in Figure 5.6.

Freeways

Freeways are fully-grade separated rights of way with four or more travel lanes and a median (concrete or striping) separating the opposing traffic. The closest connection to the U.S. 101 Highway is 40 miles west of Clearlake, connected via SR 29 or SR 175. Interstate 5 is 50 miles east of the City via SR 20. These highways are major north-south routes in California.

Arterials

The purpose of an arterial designated roadway is to link trip generating uses. They typically connect cities and towns, and serve primarily as a high capacity segment of the regional transportation system. Providing access to local communities and clustered land uses is a secondary use of arterial roadways. Lake County designates local, “main street” types of roadways as arterials. Within Clearlake, State Route 53 acts as a major arterial, while Lakeshore Drive, Olympic Avenue, Arrowhead Avenue, and Old State Highway 53 can be identified as minor arterial rights of way.

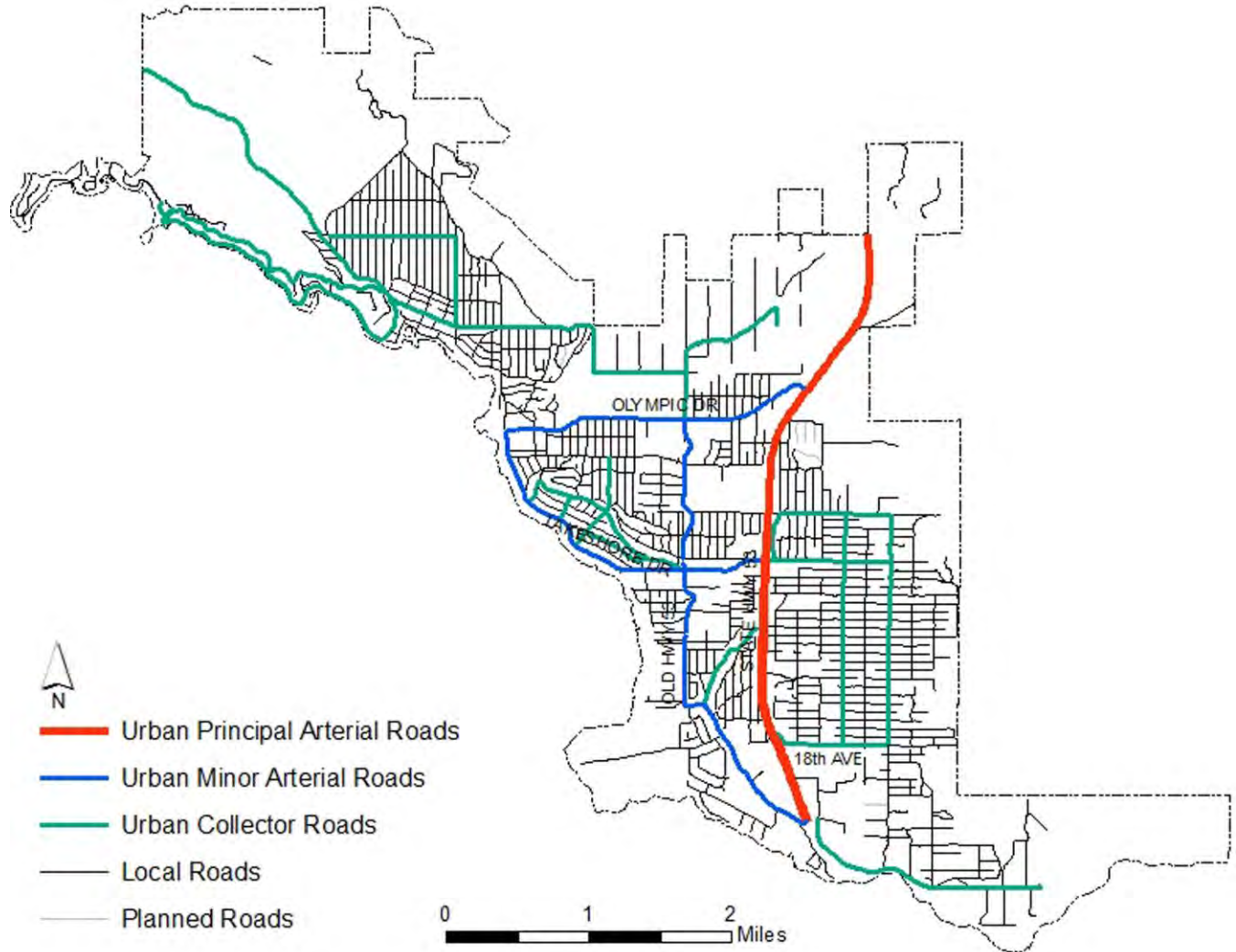
Collectors (major and minor)

Collectors act as connections between larger capacity rights of way as well as residential clusters, service facilities, or economic centers. They are primarily utilized for shorter trips within city limits. Examples of collectors in Clearlake are Phillips Avenue, Davis Avenue, and Sulphur Bank Drive.

Local Roads

Local streets and roads serve as land access facilities providing direct access to adjacent developments. Local roads and streets primarily provide traffic movement within communities and are generally low speed, low volume roads. Traffic movement is of secondary importance on the local system. It is appropriate to assume a low capacity and low vehicle miles traveled (VMT) on local roads.

Figure 5.6 Existing Street Hierarchy



Cal Poly Land Use Inventory, 2012

Local Roadway Network

The City's road system consists primarily of a grid pattern with some limitations. State Route 53 traverses the City from north to south with limited crossings while presents a challenge to east-west flow of traffic. Approximately 56 percent of roadways within the City limits are paved.

East-West Connections

The major East-West connections in the City are identified as follows:

- Olympic Drive
- Eastern section of Lakeshore Drive / 40th Avenue
- Southern section of Old State Highway 53 / Dam Road

The City's street grid is set up where there are a limited number of crossover points along State Route 53. This limits the number of traffic conflict points and allows through traffic to take

priority on SR 53. This has a direct effect on routing choices within the City. Lakeshore Drive runs as an East-West arterial connecting the downtown with the Avenues (at 40th Avenue). When it reaches the Lake, its path turns north and follows the contours of the Lake.

North-South Connections

North-South connections link the City's downtown with the northern neighborhoods and allow for local trips between neighborhoods. If the travel distance is short, trips tend to remain along local roads and local collector streets, particularly in larger neighborhoods like the Avenues.

The major North-South connections in the City are identified as follows:

- SR 53
- Northern section of Old State Highway 53
- Western section of Lakeshore Drive
- Phillips Avenue

Traffic bypasses the City along SR 53. Old State Highway 53 acts as a local north-south route parallel to SR 53 and serves the community as a minor arterial road. Lakeshore Drive serves the lakefront communities including residential areas.

Lakeshore Drive

Lakeshore Drive has been identified in the city as a major corridor with a concentration of businesses and services. Lakeshore Drive intersects with SR 53 and travels east until it reaches Clear Lake, where it turns and becomes a north-south roadway. Adjacent to Clear Lake, Lakeshore Drive is aligned with the shoreline as it meanders north into the residential area in the northeastern part of the city.

Old 53/Dam Road

Dam Road intersects SR 53 and forms the east leg of a four-way intersection; the west leg is formed by Old Highway 53. Approximately 300 feet to the east of the signalized intersection at SR 53/Dam Road/Old Highway is an all-way stop sign controlled intersection. Here, Dam Road forms the west and south legs of the intersection, while the east leg serves as entrance into the Wal-Mart shopping center. The north leg (Dam Road Extension) provides access to a community college campus and other uses.

Olympic Drive

Olympic Drive is a two-lane road with an eastbound approach that meets SR 53 at a 'T' intersection. The intersection of Olympic Drive/SR 53 is all-way stop controlled. The California Department of Transportation (Caltrans) plans to signalize this intersection in the near future.

18th Avenue

18th Avenue is a two-lane collector street with intermittent dirt shoulders, significant vertical curves and a horizontal "S" curve to the east of SR 53. It provides access to Redbud Hospital and several other streets serving the residential area east of SR 53 referred to by residents as "the avenues".

SR 53 is part of the California Freeway and Expressway System and runs as a north-south connection. The route begins at California State Route 29 in Lower Lake and ends north of the City at State Route 20. SR 53 serves as a roadway system linking the communities around Clear Lake. Within City limits, SR 53 ranges from a two lane (one lane in each direction) to four lane (two lanes in either direction) road.

Road Design Standards

Design Criteria and Application of Standards

The primary roadway design standards are based on the latest Caltrans "Highway Design Manual (HDM) - Sixth Edition" and, NCHRP 672 for Roundabouts. Specifications are summarized in Table 5.2.

Table 5.2 Lake County Road Design Specifications				
	Minor Arterial	Major Collector	Minor Collector	Local
Design Speed	60 mph	50 mph	40 mph	30 mph
Number of Lanes	2-4	2	2	2
Lane Width	12 ft	12 ft	11 ft	11 ft
Right-of-Way Width	60 ft	50 ft (min)	50 ft	50 ft
Maximum Grade	12%	1%	12%	16%

Lake County General Plan, Circulation Element, 2008

The following list represents some general design criteria used to develop the alignment alternatives.

General Roadway Parameters:

- Design Vehicle: STAA and California (HDM, Index 404.3)
- Design Speed (V): 45 mph (advisory standard minimum) on local routes at overcrossings (OC)
- Horizontal Curves: 25 mph at ramp termini and 50 mph at ramp exit nose. (HDM, Index 504.3)
- Typical Cross Section(s): 12-foot lanes, 8-foot shoulders, 4-foot shoulders (left shoulders along ramps)
- Slopes: fills @ 4: 1 per (HDM, Index 304.1) and cuts @ 2: 1
- Lane Drops: 50: 1 minimum (HDM, Index 504.3)
- Vertical Clearance: 16.5 feet, (HDM, Index 309.2)
- Overcrossing profiles set at 25 feet above SR 53 to allow for false work and cast in place construction
- Deceleration Length: (HDM, Table 405.2B)

Grades and Profiles

All proposed grades for ramp intersections and local roadway alignments shall meet all geometric design standards for profile grades noted in HDM. Overcrossing grades are assumed to be 4 percent or less.

Road Conditions

The City of Clearlake is responsible for the management, repair, and maintenance of approximately 111.6 centerline miles in 411 sections of which 62.7 miles are paved. Approximately 56.2 percent of all City roads are paved (Clearlake Pavement Management Plan, 2008). Figure 5.7 maps the paved, unpaved, and unimproved surface conditions. Table 5.3 shows a summary of the network's paved roads statistics.

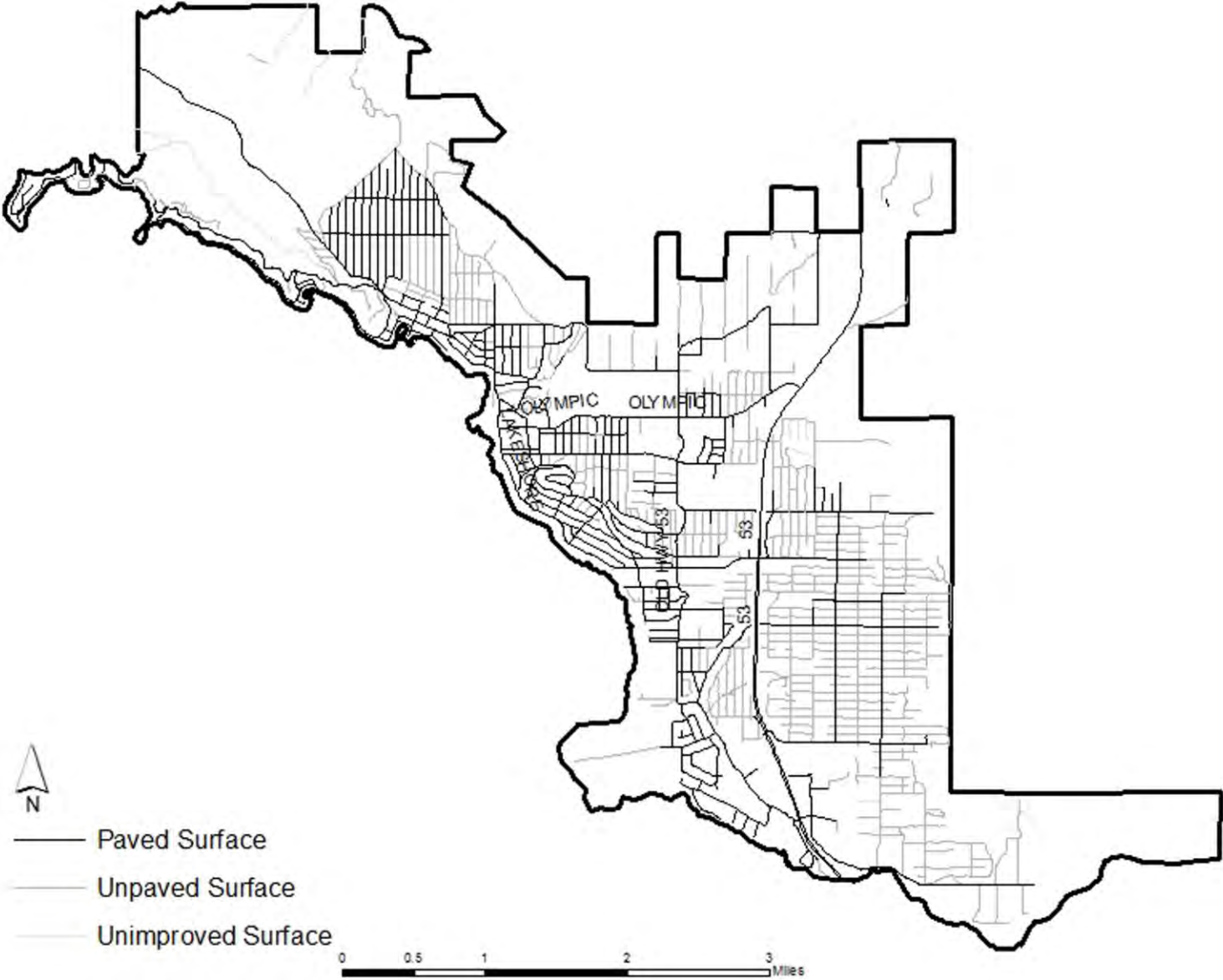
The pavement condition index (PCI) is a measurement of pavement grade or condition and ranges from 0 to 100. A newly constructed road would have a PCI of 100, and a failed road would have a PCI of 10 or less. As of 2008 (Pavement Management Plan), the average PCI of the City's street network is 39, which is considered in "poor" condition. Figure 5.8 illustrates the definitions of the pavement condition categories.

Table 5.4 depicts the average condition of the road network by functional classification. To resolve "poor" pavement conditions, the City has been utilizing crack seals and surface treatments, such as slurry seals and chip seals, as a means of preventive maintenance when the pavement is in a "fair" or above condition. Below "fair" condition, overlays and reconstruction are needed. Approximately two thirds of the City's paved roads are considered "poor" or below (categories IV and V), and 17.5 percent of the City's paved roads are considered to be in "good" or "excellent" condition (category I), as illustrated in Figures 5.8 and 5.9.

Table 5.3 Network Summary Statistics (Paved Roads)			
Functional Class	Sections	Centerline Miles	Lane Miles
Arterial	33	16	32
Collector	27	11.8	23.5
Residential/Local	179	24.9	69.8
Total	239	62.7	125.3

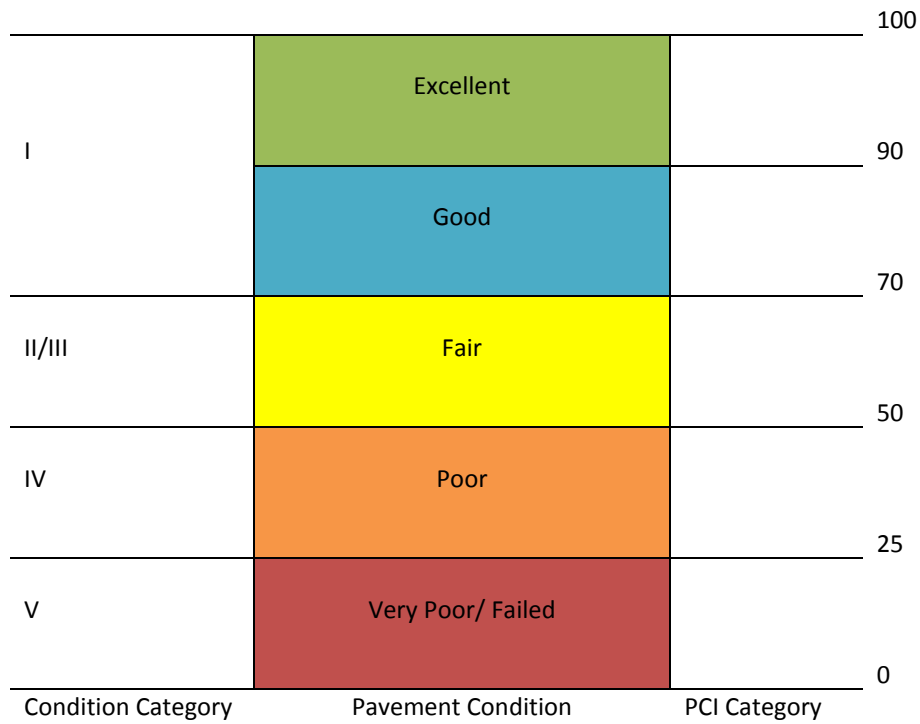
City of Clearlake Pavement Management Plan, 2008

Figure 5.7 Paved and Non-paved Surface Conditions of Roads in Clearlake



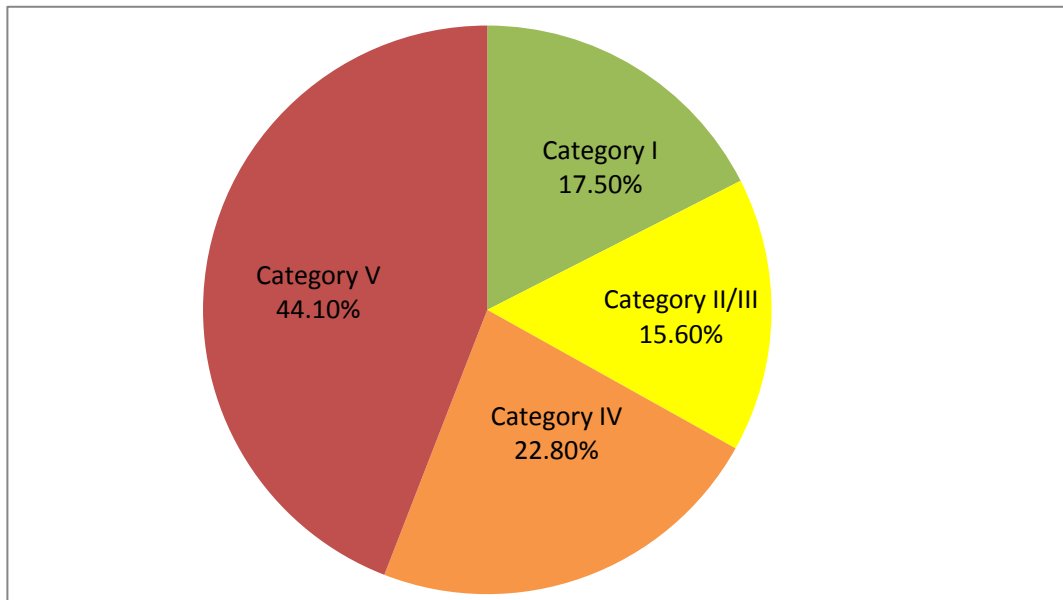
City of Clearlake Pavement Management Plan, 2008 and Cal Poly Land Use Inventory, 2012

Figure 5.8 Pavement Condition Categories by PCI



City of Clearlake Pavement Management Plan, 2008

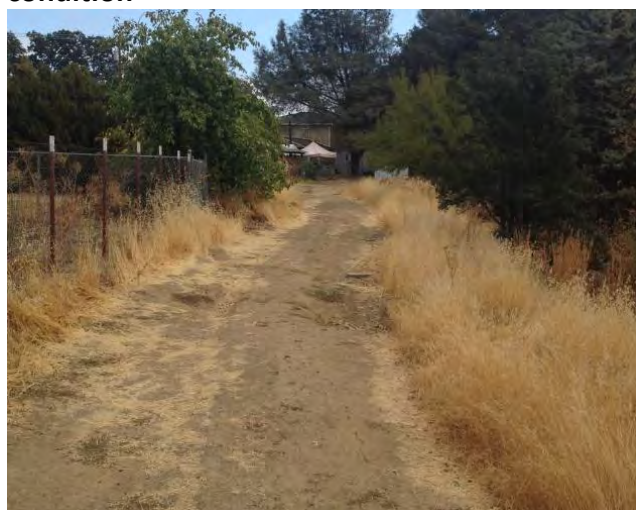
Figure 5.9 Pavement Condition Summary by Condition Category



Clearlake Pavement Management Plan, 2008

Table 5.4 Functional Classification of Roads	
Functional Class	Average PCI (weight by area)
Arterial	58
Collector	37
Residential/Local	33
All	39
<i>City of Clearlake Pavement Management Plan, 2008</i>	

Example of a road in poor condition condition



Cal Poly Planning Team, 2012

Example of a road in excellent/good



Cal Poly Planning Team, 2012

The Pavement Management Plan of 2008, projected that over the next 10 years (until 2018), the network average PCI is projected to decrease to 19. At least \$1.1 million per year will be needed to maintain the status quo, and \$1.4 million or more will be needed to improve the network condition to a higher PCI standard. It is recommended, by the Pavement Management Plan, that the arterial and collector streets be inspected every two years and residential streets be inspected every four to five years.

2. Regulatory Framework

Complete Streets

The National Complete Streets Coalition defines complete streets as streets that are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. The California Complete Streets Act (Assembly Bill (AB) 1358) of 2008 states that “in order to fulfill the commitment to reduce greenhouse gas emissions, make the most efficient use of urban land and transportation infrastructure, and improve public health by encouraging physical activity, transportation planners must find

innovative ways to reduce vehicle miles traveled (VMT) and shift short trips in the automobile to biking, walking and use of public transit” (Governor’s Office of Planning and Research, 2010). In 2011, AB 1358 affected local General Plans by adding the following language: “legislative body shall modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users of the street, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan” (Governor’s Office of Planning and Research, 2010).

Truck Routes

There is one identified truck route within the City. SR 53 is currently the sole designated routing for trucks. This route is under the jurisdiction of the California Department of Transportation. According to Caltrans, truck traffic is reported at the beginning and end of SR 53. At the SR 53 / SR 20 intersection, 6.3 percent of all traffic comprises trucks while 5 percent of traffic at the SR 53/ SR 29 intersection comprises trucks.

Level of Service

Level of Service (LOS) is a qualitative index of the user experience of travelers in the transportation system (pedestrians, bicyclists, transit riders, and auto occupants), by standards in the Highway Capacity Manual (HCM). Level of Service is measured by a scale that ranges from A to F, where A indicates no congestion of any kind and F indicates congestion and delays. Table 5.5 shows the general definitions of LOS.

Level of Service	General Operating Conditions
A	Free Flow
B	Reasonably Free Flow
C	Stable Flow
D	Approaching Unstable Flow
E	Unstable Flow
F	Forced or Breakdown Flow
<i>American Association of State Highway and Transportation Officials, 2004.</i>	

The American Association of State Highway and Transportation Officials (AASHTO) prescribes an appropriate level of service for the following road classifications in a rural setting (AASHTO, 2004):

- Freeway: B
- Arterial: B
- Collector: C
- Local: D

Level of Service is a tool that is used to predict the perceived user experience. The LOS of signalized intersections can be calculated using a software program called Synchro. LOS of un-

signalized intersections was calculated using a different criterion than the HCM. According to the SR 53 Corridor study done by TJKM Transportation Consultants in 2011, all regional study intersections operate at an acceptable LOS C or better, except for the two-way stop controlled intersection of SR 53 and SR 20 that operates at LOS F during the p.m. peak hour (TJKM Transportation Consultants, 2011). Calculations based on the 2000 HCM indicated the LOS as shown in Table 5.6. The red dots in Figure 5.10 show the locations of the study intersections.

Table 5.6 Existing Conditions						
ID	Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS
1	SR 53/ SR 20	Two-Way Stop	18.0	C	113.2	F
2	SR 53/ Olympic Dr	All-Way Stop	9.3	A	10.9	B
3	SR 53/ 40 th Ave	Signal	21.1	C	31.3	C
4	SR 53/ 18 th Ave	Signal	12.2	B	13.5	B
5	SR 53/ Dam Road/ Old Highway 53	Signal	25	C	32.5	C
6	Dam Rd/ Walmart Driveway	All- Way Stop	-	A	-	A
7	SR 53/ SR 29/ Main Street	Signal	23.5	C	23.1	C

Final Report—SR 53 Corridor Study, TJKM Transportation Consultants, 2011

3. Parking

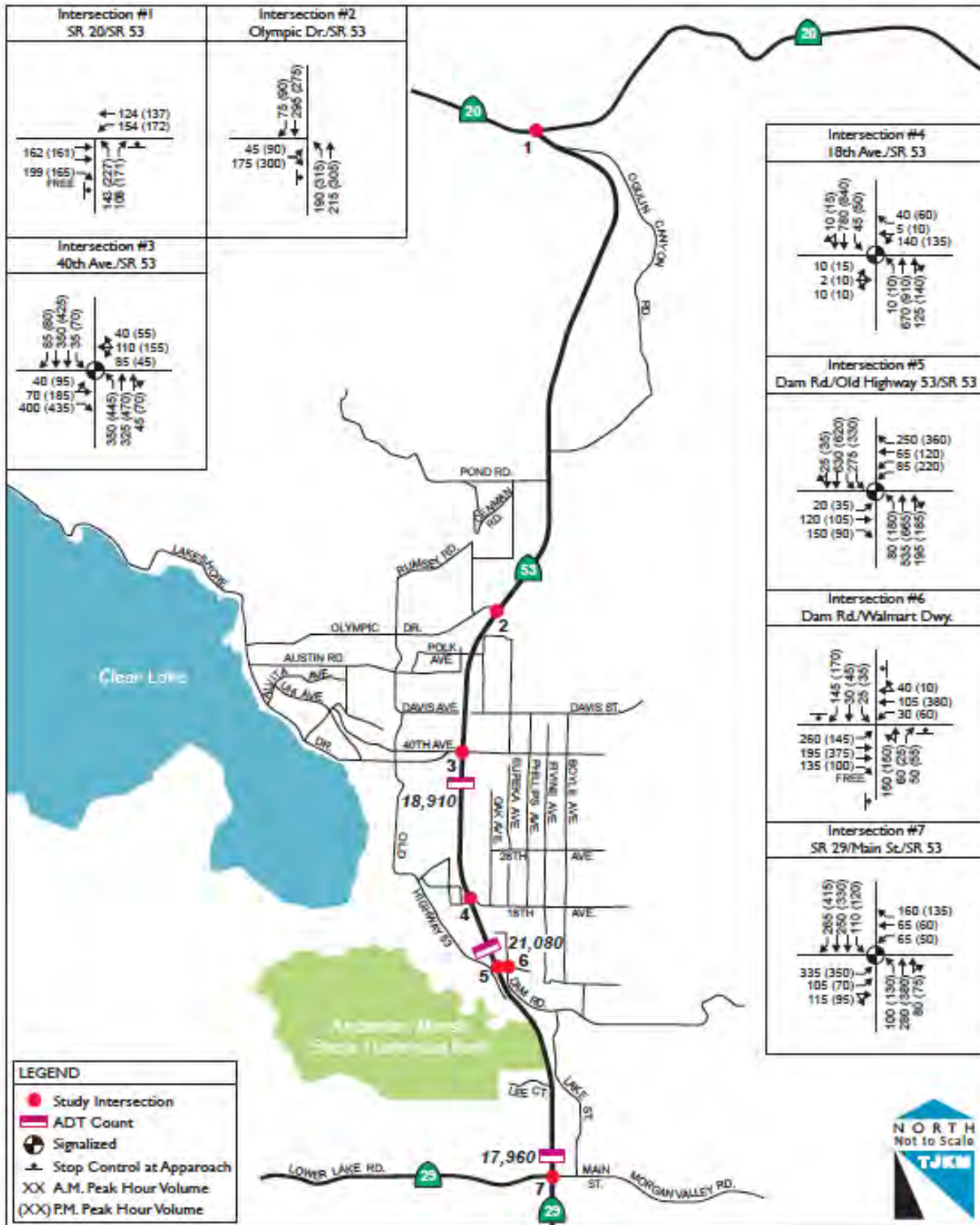
Design Regulations

Article 46 of the Lake County Parking Ordinance spells out the purpose of parking regulations . It is to assure the provision and maintenance of safe, adequate, well-designed off-street parking facilities in conjunction with any use or development, to reduce street congestion and traffic hazards, and to promote an attractive environment through design and landscaping standards for parking areas.

Design Requirements

Off-street parking requirements shall apply to all buildings erected, enlargements of existing uses, and uses initiated after the creation of Article 46 in the most recently updated Lake County Zoning Ordinance. The number of parking spaces for residential, commercial, industrial, and public services are described in Table 5.7. Other detailed parking requirements are explicitly stated in Zoning Ordinance Article 46 of Lake County.

Figure 5.10 State Route 53 Corridor Study Intersections



Final Report—SR 53 Corridor Study, TJKM Transportation Consultants, 2011

Table 5.7 Lake County: Article 46 Parking Regulations		
Uses		Spaces Required
Residential	Single-Family dwelling, duplex, or mobile home on individual lot	Two (2) spaces per dwelling unit.
	Triplex, fourplex, or multi-family dwelling	Two (2) spaces per dwelling unit; and one half (1/2) guest parking space for each dwelling unit; and for multi-family dwellings, one (1) recreational vehicle parking space per five (5) dwelling units.
	Rooming or boarding house; dormitory	One (1) parking space per rentable room in addition to the parking required for the residence; for dormitories, one hundred (100) sq. ft. of floor area shall be considered a bedroom.
	Mobile home in a mobile home park	Two (2) per dwelling unit; and one (1) recreational vehicle parking space per five (5) dwelling units; and one (1) visitor parking space per four (4) dwelling units.
Commercial	General	The larger of 4 four (4) spaces or number of spaces required for specific uses per Section 21-46.5 of Lake County Zoning Ordinance.
Industrial	General	The larger of 4 four (4) spaces or number of spaces required for specific uses per Section 21-46.5 of Lake County Zoning Ordinance.
Public Service	General	The larger of 4 four (4) spaces or number of spaces required for specific uses per Section 21-46.5 of Lake County Zoning Ordinance.
Health and care facilities	General	The larger of 4 four (4) spaces or number of spaces required for specific uses per Section 21-46.5 of Lake County Zoning Ordinance.
<i>Lake County Zoning Ordinance: Article 46</i>		

4. Transit Services

The main transit system in Clearlake is the public bus system operated by Lake Transit Authority (LTA). The objective of LTA is to provide public transit services throughout Lake County. Formed in 1996, LTA has served the community for more than 18 years. A private contractor operates the bus service and is managed by the LTA transit manager. LTA's primary source of funding comes from the Lake County/City Area Planning Council (APC).

There are three regional bus routes: two are separate north and south shoreline routes that connect Clearlake to Lakeport; and one bus route connects Deer Park to Napa County. The City is served by two local bus routes 5 and 6. LTA offers Clearlake Dial-A-Ride, which provides curb-to-curb service. LTA also offers "Flex Stop" service for passengers eligible for ADA paratransit service who reside in areas that are not served by Dial-A-Ride. Flex Stop services accommodate these travelers by traveling up to one mile off the regular bus route.

Local route fare is \$1.25 for the general public and \$0.75 for qualified residents under the Americans with Disabilities Act (ADA) and the elderly. The regional route fare is a flat rate of \$2.25. Monthly passes are available for unlimited rides on bus routes within Lake County and cost \$40.00. System weekly passes cost \$20.00, and \$10.00 punch passes are valued at \$11.00 in total fare. The Appendix includes a complete table of the fare structure.

Lake Transit Authority’s Goal and Objective

Lake Transit Authority’s goal is to “provide mobility for all citizens in Lake County.” LTA has five objectives:

1. Give special attention to the needs of the transit dependent
2. Provide persons who have disabilities with comparable access to transit facilities, programs, and services
3. Promote connectivity and coordination of service with other transportation services
4. Promote use of the transit system
5. Provide transit services in a safe, efficient, cost effective manner consistent with service needs

Transit Dependent Population in Clearlake

The potential transit dependent population is defined as youth who are under 16 and generally do not have driver’s license, the elderly who are 65 and over who may no longer be able to drive, and the disabled who cannot drive due to their disability. The pool containing potential transit dependent population is presented in Table 5.8 and Table 5.9. The data for the disabled population in Clearlake is derived from Table QT-P21: Disability Status by Sex in year 2000. Comparable data for the year 2010 was not available at the time of this report. The disabled population ages 16 to 65 years old totaled 3,183 in 2000 as shown in Table 5.8. Many residents in this category may be transit-dependent.

Approximately 3,229 youth and 2,293 seniors live in Clearlake, as shown in 5.9. Some of these residents may be transit dependent. Together, the disabled of driving age (aged 16 to 65), the youth (aged under 16), and seniors (aged 65 and over) present a pool of potential transit dependent population presented in Table 5.9. The estimate of transit dependent population is 4,037 or 26.4 percent of the total population of Clearlake. This is the product of the 2010 households with no vehicle available—1,628 households—and the average household size of 2.48.

Table 5.8 Disability Population in 2000		
Age Range	Clearlake	% of Population
16 -65 with a disability	3,183	24%
<i>U.S. Census, Table QT-P21 Summary File 3 (SF 3) - Sample Data, 2000</i>		

Table 5.9 Pool of Transit Dependent Population in 2010

Age in Years	Clearlake	Percent of Population
Under 16	3,228	21%
16-65	9,728	64%
65 and over	2,293	15%
Total Population	15,250	100%
Transit Dependent Estimate	4,037	26%

US Census. Table DP-1: Profile of General Population and Housing Characteristics, 2000
US Census. Table DP-1: Profile of General Population and Housing Characteristics, 2010

Types of Services

Regional Transit

Route 1-North Shore, Clearlake to Lakeport

Route 1 had an annual ridership of 106,770 from 2011 to 2012, an increase of 30 percent from the previous year. This route provides service along the North Shore of Clear Lake, from Clearlake on the east to Lakeport on the west, serving Clearlake Oaks, Glenhaven, Lucerne, Nice, and Upper Lake along the way. In the City of Clearlake, Route 1 operates on Olympic Drive and Burns Valley roads, and runs by City Hall and Ray’s food place and Wal-Mart.

Route 3-Highway 29, Clearlake to Deer Park

Route 3 had an annual ridership total of 23,870 between 2011 and 12, an increase of 11.8 percent from the previous year. Route 3 offers four daily roundtrips between Clearlake and Napa County destinations. The St. Helena Hospital at Deer Park is served twice daily.

Route 4-South Shore: Clearlake to Lakeport

Route 4 is the main service along the south side of Clear Lake, serving Kit’s Corner and Kelseyville. Route 4 had an annual ridership total of 52,828 in the 2011/12 year, an increase of 35.9 percent from the previous year. It is operated with 7 westbound and 8 eastbound trips, including three morning and three afternoon express routes on weekdays.

Local Transit

Route 5-Clearlake City, North Loop

Route 5 had annual ridership of 89,480 in the 2011/12 period, an increase of 16.2 percent from the previous year. Route 5 provides local hourly service in Clearlake in a figure-eight configuration, running along Yuba College, Walmart, Redbud Hospital, Austin Park, Clearlake Park, and Burns Valley Mall. Service is operated hourly Monday through Saturday, from 5:55 AM to 6:55 PM.

Route 6-Clearlake City, South Loop

Route 6 had annual ridership of 64,750 in 2011/12, an increase of 16.5 percent from the previous year. Route 6 also operates locally in the opposite direction as Route 5; and runs by Yuba College, Burn Valley Mall, Redbud Hospital, Social Services and Lower Lake High School. Operating hours are 7:00 AM to 6:00 PM, Monday through Saturday. All Lake County Transit routes are represented in Figure 5.11.

Dial-A-Ride (DAR)

Lake Transit offers Clearlake and Lower Lake Dial-A-Ride service during the same days and hours as the local bus routes. DAR provides curb-to-curb service for the general public, but prioritizes service for elderly and disabled persons. DAR service is provided based on demand, and is available Monday through Saturday, from 7:00 AM until 6:00 PM.

Flex Stop

Flex Stop is available for passengers eligible for ADA paratransit in areas that are not covered by Dial-A-Ride. The bus will travel up to one mile off its regular route to provide Flex Stop service at the curb.

Transit Service Standards

The California Transportation Development Act (TDA) sets a minimum “fare box return ratio” for each public transit organization using TDA funds (under specific articles of the TDA). The fare box return ratio is the ratio of the operating income (largely fare revenues) divided by the non-capital expenses. For Lake County, the TDA requires a minimum fare box return ratio of 10 percent. The TDA only requires this ratio be maintained for the transit system as a whole, rather than on an individual service or route basis.

The Transit Development Act (TDP) also requires a triennial review of five service standards:

- Operating cost per passenger
- Operating cost per vehicle service hour
- Passengers per vehicle service hour
- Passengers per vehicle service mile
- Vehicle service hours per employee

The Transportation Research Board (TRB) outlines criteria in the Highway Capacity Manual (HCM) for determining the quality of service of transit in terms of availability and convenience. There are four measures that establish this: service frequency, hours of service, passenger loads, and reliability. The following section discusses levels of service for service frequency and hours of service based on data available. The standard of service frequency for local transit and intercity transit, and the standard of hours of service are provided for reference in Table 5.10, Table 5.11 and Table 5.12.

Figure 5.11 Lake Transit Network



LSC Transportation Consultants, Inc., 2006; Transit Passenger Facilities Development Plan for Lake County

Table 5.10 Service Frequency LOS for Local Transit			
LOS	Headway (min)	Adjusted Service Frequency (Buses per hour)	Comments
A	< 10	> 6.0	Passengers don't need schedules
B	10 to 14	4.01 to 6.0	Frequent service; passengers consult schedules
C	15 to 20	3.0 to 4.0	Maximum desirable time to wait if bus is missed
D	21 to 30	2.0 to 3.0	Service unattractive to choice riders
E	31 to 60	1.0 to 2.0	Service available during each hour
F	> 60	< 1.0	Service unattractive to all riders
<i>Highway Capacity Manual, 2000</i>			
Note: Hours of Service refers to the number of hours that transit operates in a given day. The more hours that a service is available to riders the higher its level of service is.			

Table 5.11 Service Frequency LOS for Intercity Transit		
LOS	Vehicles per Day	Comments
A	> 15	Numerous trips throughout the day
B	12 to 15	Midday and frequent per hour service
C	8 to 11	Midday or frequent per-hour service
D	4 to 7	Minimum service to provide choice of travel time
E	2 to 3	Round trip in one day is possible
F	0 to 1	Round trip in one day is not possible
<i>Highway Capacity Manual, 2000</i>		

Table 5.12 Hours of Service LOS		
LOS	Vehicles per Day	Comments
A	> 18 to 14	Night or owl service
B	> 16 to 18	Late evening service provided
C	> 13 to 16	Early evening service provided
D	> 11 to 13	Daytime service provided
E	> 3 to 11	Peak-hour service; limited midday service
F	0 to 3	Very limited or no service
<i>Highway Capacity Manual, 2000</i>		

Transit System Performance

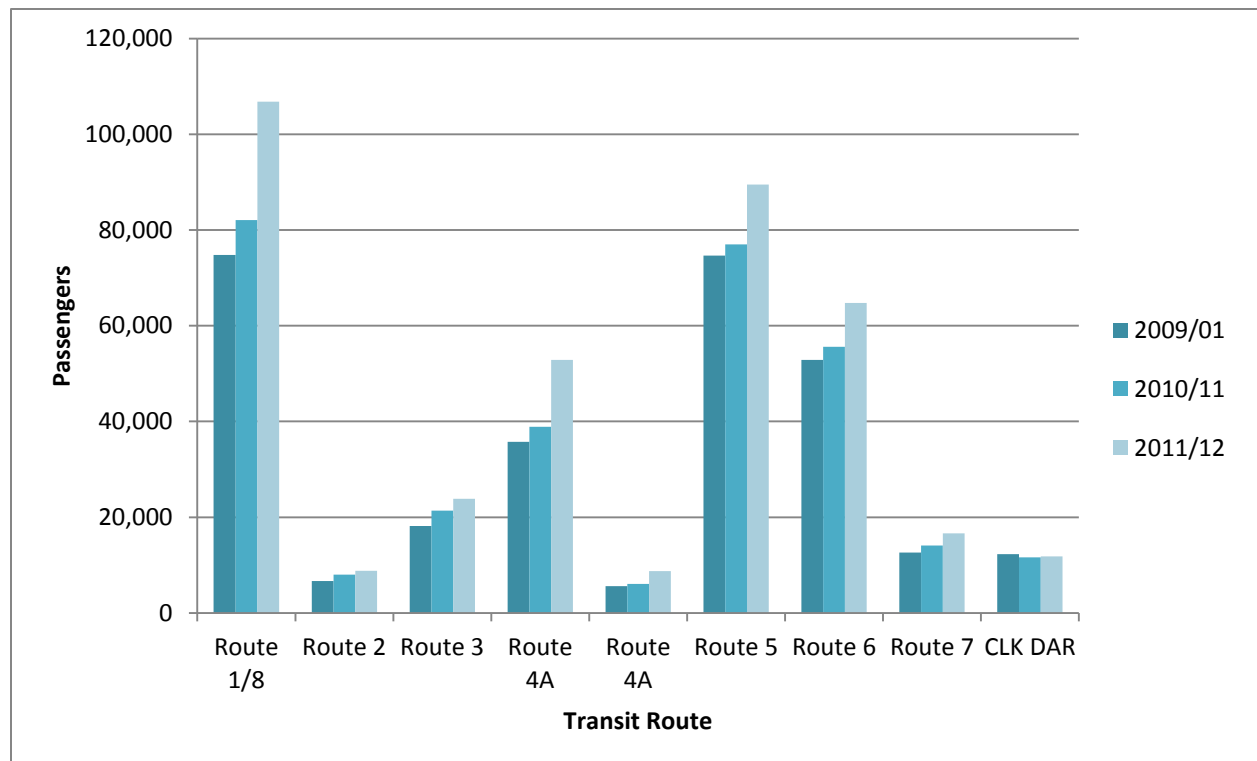
The fare box recovery ratio is calculated by dividing the passenger revenues by the total operating costs. According to LTA 06-07 annual report, all local and regional bus routes in Clearlake met the minimum fare box return ratio except for the dial a ride service.

Another way to look at transit service performance is to compare transit ridership in recent years. Figure 5.12 illustrates the ridership by each bus route in 3 consecutive year terms: 2009/2010, 2010/2011, and 2011/2012. All local and regional bus routes in Clearlake showed an increase in ridership each consecutive term. The regional bus Route 1, Route 3, and Route 4 had a ridership increase of 30 percent, 11.8 percent, and 35.9 percent, respectively, between

2010 and 2011. The local bus during the same time period, Route 5 and Route 6 had an increase of 16.2 percent and 16.5 percent of ridership, respectively. This data suggests the effectiveness of the bus route has improved over time, evident in increased ridership.

According to the 2011-12 Lake Transit Authority Annual Report, Clearlake local Routes 5 and 6 carried 154,320 passengers, and Dial-A-Ride recorded 11,838 passengers. The total local route boardings represented 11.13 passenger trips per capita for the City, which is comparable to the average passenger trips of 12.66 trips per capita for urbanized areas with populations between 200,000 and 1,000,000 people. There is relatively high transit ridership in Clearlake.

Figure 5.12 Comparison of Annual Ridership by Route



2011-2012 Lake Transit Authority Annual Report

Table 5.13 presents the levels of service for Service Frequency and Hours of Service for all bus routes in Clearlake based on the Highway Capacity Manual to determine the transit quality of service in terms of availability and convenience. The local Route 5 and Route 6 carry a significant amount of riders and are the key local bus routes in Clearlake. However, the Service Frequency and Hours of Service of these local routes were rated below C. Similarly, regional Route 1 and Route 4 had C ratings for their Service Frequency, and regional Route 3 had a D rating for its Service Frequency. Regional Route 1, 3 and 4 all had D ratings for Hours of Service.

Table 5.13 LOS for Selected Routes					
Service Performance	Regional Route			Local Route	
	Route 1	Route 3	Route 4	Route 5	Route 6
Service Frequency Level of Service	C	D	C	E	E
Hours of Service Level of Service	D	D	D	D	E
2011-2012 Lake Transit Authority Annual Report					

Conditions of Transit Facilities

The condition of transit facilities is not included in the level of service calculation but plays a vital role in the overall bus user’s experience. Bus facilities, specifically the bus stops, in the City are in a wide range of conditions. Some bus stops are well maintained, have a shelter and sidewalk, such as the bus stop near the Wal-Mart as shown in first photo below. However, there are also bus stops that are not in good condition and lack basic amenities, such as a bus bench, shelter, or sidewalk, as the second image below shows. This inconsistency in facility conditions may be contributing to the low levels of transit ridership.

Standard Bus Stop near Wal-Mart



Cal Poly Planning Team, 2012

Bus Stop in Need of Maintenance and Amenities



Cal Poly Planning Team, 2012

5. Intercity Passenger Rail and Bus

The City of Clearlake does not have any passenger rail facilities. The closest connection to Amtrak passenger rail services is in Davis, California approximately 93 miles southeast from the City. The closest Amtrak bus stop connection is in Cloverdale, CA approximately 56 miles west of Clearlake. The closest Greyhound and Trailways bus stop connections are in Santa Rosa, CA approximately 50 miles south of Clearlake.

6. Aviation

There are no active airport locations within Clearlake. Lampson Field in Lakeport is the central public airport in Lake County. This location is equipped for the following:

- General aviation traffic
- Aircraft repair and maintenance
- Flight training
- REACH Air Medical Services for St. Helena, Clearlake Hospital, and Sutter Lakeside Hospital for out of county transport
- Emergency response and firefighting staging for CalFIRE, The U.S. Forest Service, and The Bureau of Land Management

The closest international commercial airport is the Sacramento International Airport (SMF), approximately 92 miles southeast of the City.

7. Traffic Safety

This section covers traffic safety. It assesses traffic safety conditions and analyzes traffic fatality and injury rates.

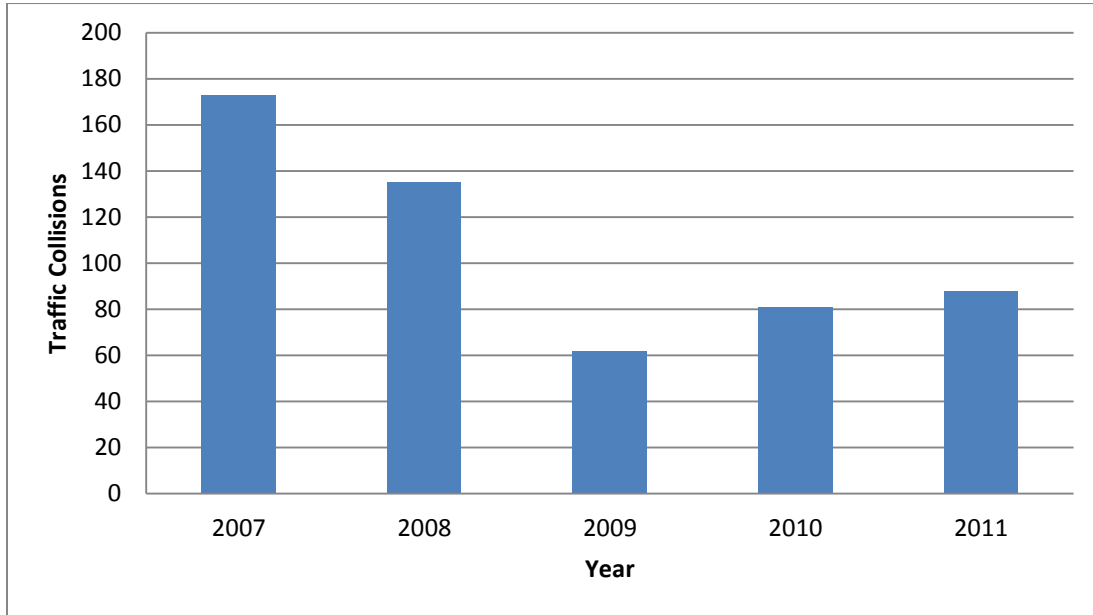
Collision Trends

Reportable collision statistics for the City are included in this section. Any reported collision within the public right of way that involved a fatality, personal injury, or property damage was reported as a collision.

While reported collisions do not represent all collisions that occur within the City, they provide a good source of preliminary data. The number of reported traffic collisions varies due to many social factors. Often minor traffic collisions, non-injury collisions, and private property collisions are unreported and are therefore not reflected in this data. Figure 5.13 shows the reported traffic collisions in the last five years in Clearlake.

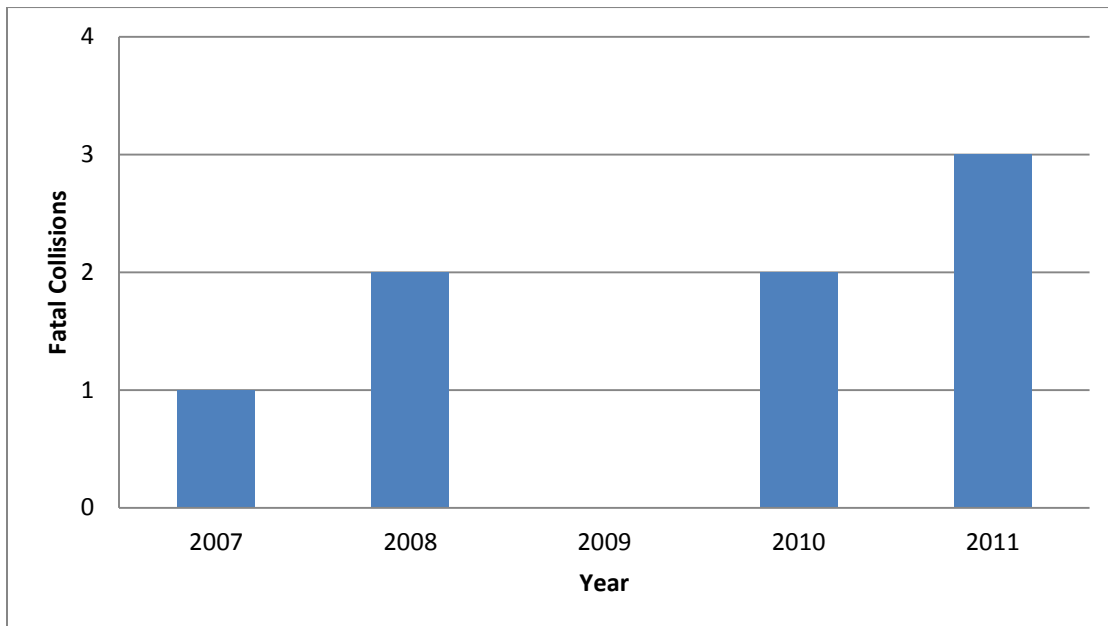
There has been a general downward trend in reported collisions since 2007, as shown in Figure 5.13. Figure 5.14 shows a general upward trend in collision fatalities between 2007 and 2011. There were eight fatalities in Clearlake from 2007 to 2011, with no fatalities in 2009. Figure 5.15 shows the location of fatal accidents and major injury accidents. While collisions are scattered throughout the City there is a clear concentration at the intersection of SR 53 and Olympic Drive, which is slated for signalization.

Figure 5.13 Five-Year Collision Trends



California Highway Patrol Annual Report of Fatal and Injury Motor Vehicle Traffic Collisions

Figure 5.14 Five-Year Collision Fatality Trends



California Highway Patrol Annual Report of Fatal and Injury Motor Vehicle Traffic Collisions

8. Bicycle Transportation

It was shown in Table 5.1 that the biking modal split in Clearlake is well above the national, state and county averages. Biking in Clearlake has the potential to become a more utilized form of transportation since Clearlake is a small city, with many amenities and destinations located within city limits and within biking distance. There are many hurdles to overcome as well. Clearlake is rather hilly in many places, it doesn't have safe biking facilities on many roads, many existing city roads are not paved or are in poor condition, and SR 53 is not conducive for bicycle crossing. Despite these obstacles, Lake County and the City of Clearlake have made strides to create a continuous bicycle network.

Unmarked and Marked Bike Facilities in Clearlake



Cal Poly Planning Team, 2012



Google Streetview, 2012

The Role of Bikeways

Constructing bikeways is one way of improving bicycling safety and convenience. Bikeways help accommodate bicycle traffic on shared motor vehicle roadways, or they act as a complement to the motor vehicle road system in order to meet cycling needs which are not adequately met by conventional roads. Off-street bikeways developed in exclusive corridors can also create new recreational opportunities or desirable commuter routes. On-street bikeways can enhance safety and convenience, especially if other roadway enhancements are made, such as increasing road width, reallocating lane width to accommodate bike lanes, eliminating surface irregularities, and installing bicycle-sensitive loop detectors at signalized intersections. (Chapter 1000, Caltrans Highway Design Manual, January 2007).

Bikeway Definitions

The Streets and Highway Code Section 890.4 defines a "Bikeway" as a facility that is provided primarily for bicycle travel. The following are Caltrans definitions and design standards for bicycle facilities, as described in the Caltrans *Highway Design Manual*:

Class I (Bike Path)

A Class I facility provides a completely separated facility designed for the exclusive use of bicycles and pedestrians with minimal cross flows by motorists. Caltrans standards call for Class I bikeways to have a minimum of 8 feet of pavement with 2 feet graded shoulders on either side, for a total right of way of 12 feet. These bikeways must also be at least 5 feet from the edge of a paved roadway.

Class II (Bike Lane)

A Class II facility provides a restricted right of way designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross-flows by motorists permitted. Caltrans standards generally require a 4-foot bike lane from the face of a curb or edge of a roadway with a 6-inch white stripe separating the automobile lane from the bike lane.

Class III (Bike Route)

A Class III facility is a roadway that is designated with bike route signs to be shared by bicyclists and motorists. These routes provide direct travel for commuting and can act as a link between Class I and II bikeways. No minimum width is specified for bike travel. Any bikeway which shares a through-traffic right of way with motor vehicles and pedestrians is considered a Class III bikeway.

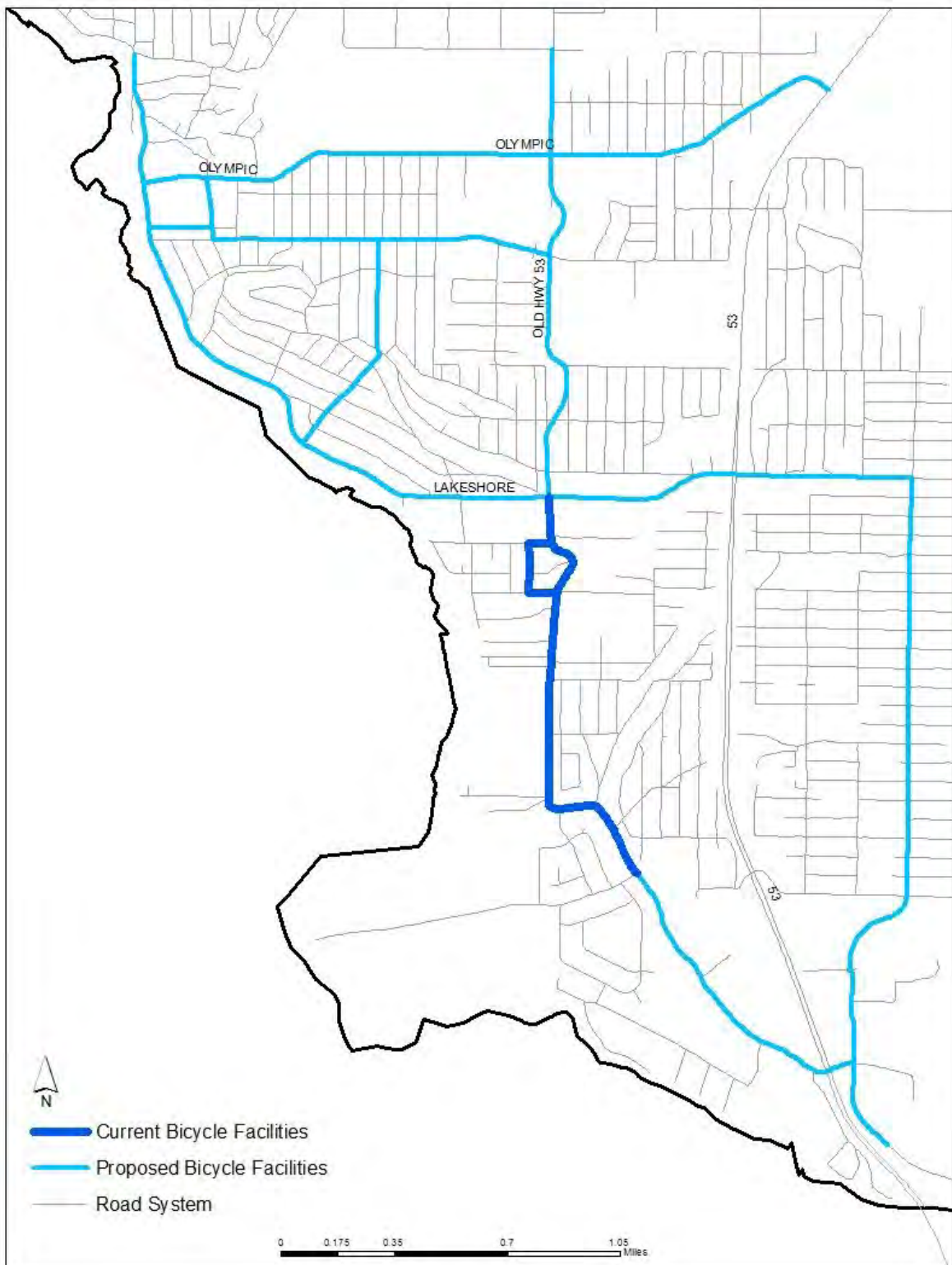
Existing Bikeways

In 2011, Lake County completed the Regional Transportation Bikeway Plan. The plan outlined the existing and proposed bikeways in the City of Clearlake, as shown in Figure 5.16. In 2011 the City had 1.32 miles of bike lanes. The City is working to create a more comprehensive bike network. Bike lane construction is made in accordance with the five-year horizon bikeway implementation program outlined in Table 5.14.

Class	Roadway	From	To	Length (ft)	Transit Route Link	Estimated Cost (in \$1,000)
II	40 TH Ave	SR 53	Phillips Ave	2,243	N	\$1.5
II	Austin Ave	Lakeshore Dr	Old Highway 53	5,271	N	\$1,000
II	Burns Valley Rd	Bowers Ave	Olympic Drive	1,343	Y	\$304
II	Dam Rd	Lake St	SR 53	2,973	Y	\$422
II	Dam Rd Extension	Dam Rd	18 TH Ave	2,726	Y	\$387
II	Old Hwy 53	Lakeshore Dr	Olympic Dr	4,574	Y	\$305
II	Old Hwy 53	Lakeview Way	Dam Rd	3,636	Y	\$600
II	Olympic Dr	Lakeshore Dr	SR 53	9,127	Y	\$1,300
II	Phillips Ave	40 th Ave	18 TH Ave	5,283	N	\$750

Lake County Regional Bikeway Plan, 2011

Figure 5.16 City of Clearlake Short Range Bikeway Implementation Program



Lake County Regional Bikeway Plan, 2011

9. Pedestrian Circulation

Walking is not a common mode of transportation in Clearlake. As noted earlier in Figure 5.2, 5 percent of residents walk to work as their commute mode. While this number is low, it is also much higher than the national, state and county averages. This may be because walking is an economical form of transportation, or due to the pleasant walking experience provided by the naturally forested and rural character of Clearlake.

Despite the positive attributes of pedestrian circulation, there is a clear lack of sidewalks and proper infrastructure for pedestrians. Sidewalks are rare in the City. Even such major thoroughfares as Old Highway 53 and Lakeshore Drive do not have sidewalks. This situation poses a challenge to pedestrians. The following section discusses one way the *Highway Capacity Manual* attempts to evaluate pedestrian level of service (LOS).

Pedestrian Walkway LOS

Although the level of service criteria for pedestrian flow is based on subjective measures, it is possible to define ranges of space per pedestrian, flow rates, and speeds, which can then be used to develop quality-of-flow criteria. Table 5.15 provides descriptions of walkway LOS. Although sufficient pedestrian volumes do not exist in Clearlake to warrant assigning a level of service rating to various streets, it is worth keeping the criteria for pedestrian LOS in mind when planning future roadway and street enhancements.

LOS	Pedestrian Space (ft²/p)	Flow Rate (p/min/ft)	Comments
A	>60	≤ 5	Pedestrians move in desired path, conflicts between pedestrians unlikely.
B	>40-60	>5-7	Sufficient space for pedestrians to select walking speeds freely, to bypass other pedestrians; pedestrians begin to be aware of other pedestrians.
C	> 24-40	> 7-10	Sufficient space for normal walking speeds; reverse direction or crossing movements can cause minor conflicts, and speeds and flow rate are somewhat lower.
D	> 15-24	> 10-15	Restricted freedom to select individual walking speed and to bypass other pedestrians; cross-flow movements have high probability of conflict, causing frequent change in speed and position.
E	> 8-15	> 15-23	Virtually all pedestrians restrict their normal walking speed; space not sufficient for passing slower pedestrians; cross-flow movements possible only with extreme difficulties.
F	≤ 8	Varies	All walking speeds are severely restricted, forward progress is made only by shuffling; frequent, unavoidable contact with other pedestrians; cross-flow movements are virtually impossible; space is more characteristic of queued pedestrians than of moving pedestrian streams.

Highway Capacity Manual 2000, Transportation Research Board

Sidewalk Conditions

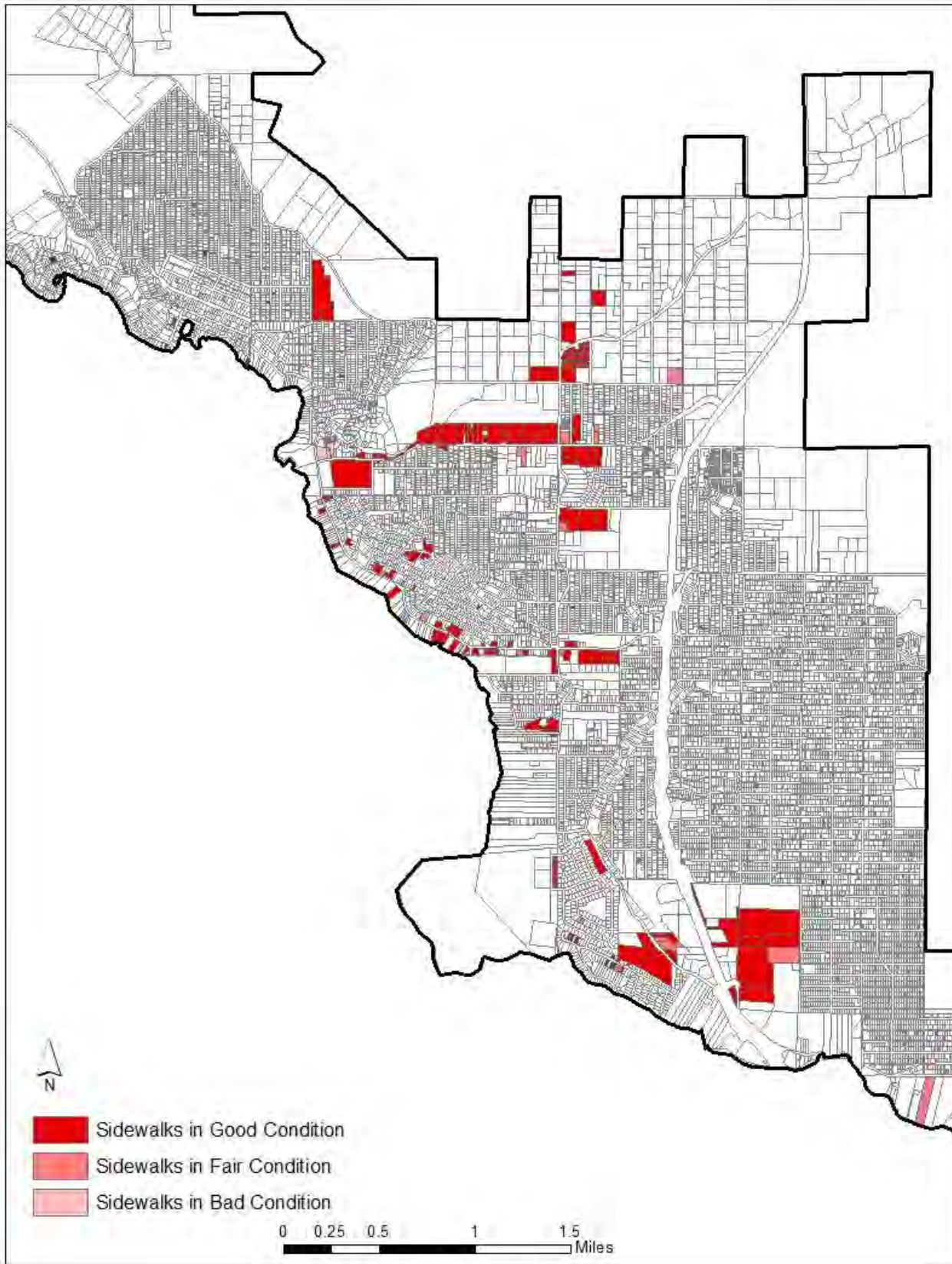
A sidewalk inventory was completed as part of the land use inventory performed by the planning team in October 2012. Of the 14,513 parcels in Clearlake, approximately 99 percent of the parcels do not have sidewalks. Figure 5.17 shows the results of the sidewalk inventory. The majority of residential neighborhoods lack sidewalks, and major arterials are missing sidewalks as well. The majority of sidewalks are present along roads in front of public parks and schools, recent large-scale commercial centers have sidewalk infrastructure as well. Without adequate sidewalks, pedestrians are forced to move onto the street, potentially placing the pedestrian in harm's way and at risk of collision with a motor vehicle or bicycle.

Safe and complete sidewalks may be necessary to encourage children to walk to school rather than be dropped off by an automobile. In order to encourage walking as a viable mode of transportation, there needs to be a strongly connected system of sidewalk facilities to improve the pedestrian circulation environment.

C. EMERGING DIRECTIONS

Research on the existing circulation conditions and community input reveals certain emerging directions. The community would like to see a well-maintained, connected, and safe sidewalk system that can facilitate safe and connected pedestrian access. Street and road maintenance is identified as a priority by residents. This has been a problem for a long time and the City is taking steps to address it. There are also a number of intersections that could be improved, based on their levels of service. The intersections that have been identified are SR 53/SR 20, SR 53/40th Avenue, SR 53/Dam Road/Old Highway 53 and SR 53/SR 29/Main Street.

Figure 5.17 Sidewalk Condition Inventory



Cal Poly Land Use Inventory, 2012.

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